Net Metering

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Among the policy options available to encourage the use of small renewable energy systems, net metering is one of the most appealing and is widely used by states. A key part of this appeal seems to be the greater sense of fairness it gives to utility customers who are generating their own electricity. Currently, there are net metering laws or regulations in more than 30 states. It is a low-cost, easily administered method to encourage consumer investment in renewable energy technologies.

Net metering is a utility metering practice in which utilities measure and bill for the net electricity consumption or generation of their customers with small generators. This is typically done with a single, bi-directional electric meter. The electric meter will turn backward when the generator is producing energy in excess of the customer's demand and forward when the customer's demand exceeds the energy generated. This enables customers to use their own generation to offset their consumption during a billing period. This offset means that, in effect, customers receive retail prices for the excess electricity they generate. It allows customers to "bank" their excess energy and use it at a different time than it is produced, giving customers more flexibility and allowing them to maximize the value of their production. This is especially useful for intermittent renewable energy technologies such as wind. Consumers do not have to alter their consumption or install energy storage devices to maximize the value of their wind generation. It allows all (or a substantially bigger portion) of the customer-generated electricity to command a retail value and thus increase the economic value of the wind turbine.

Without net metering, customers must enter into a net purchase and sale agreement with their utility. In these cases, the utility always installs two uni-directional meters to separately record the total energy from the utility used by the customers and the total excess energy produced by the customers. These customers pay retail rates for the energy they use, and the utilities reimburse customers at the utility's avoided cost for the excess energy they produce. The difference between a utility's retail rate and its avoided cost can be substantial, often a 5-cent to 10-cent differential per kilowatt-hour (kWh).

Net metering programs exist because of state (sometimes utility) initiatives. Federal law already encourages cogeneration and renewable energy technologies by requiring

utilities to interconnect with self-generators and to purchase power generated by them. Many individual states have taken the further step of requiring net metering to be offered as an option for customers with smaller renewable energy generators.

The key elements of net metering legislation/rules are as follows:

- **Require all utilities to offer net metering.** In states where the net metering authority comes from legislation, this is usually the case. In states where the net metering authority comes from public utility commission rulings, only the investor-owned utilities are usually affected. But these utilities typically have urban service territories, and the opportunities for small wind power are primarily in rural areas. Thus, net metering based on legislation is usually more beneficial for wind power.
- **Require a simple interconnection agreement/process with no or minimal fees.** This is important to prevent the interconnection process from being overly long, costly, or complicated.
- **Prohibit additional liability insurance above standard homeowners insurance.** This provision is closely tied to the element below.
- **Indemnify the utility for damages caused by net-metering customers.** Utilities typically seek such legal protection.
- **Stipulate that no additional technical standards or testing can be required beyond those already nationally recognized.** The existing national standards include provisions for safe interconnection to the utility. In particular, the generation devices must be able to detect a utility outage and stop delivering electricity (or generating a voltage) to the utility grid as long as the outage continues.
- **Identify the maximum eligible generator size.** Most states have selected a maximum generator size that is eligible for net metering. This maximum size varies widely (from 10 kW up to 1 MW). A larger maximum size allows more customers to benefit from net metering. A 10-kW limit is adequate to allow most homes and farms and some small businesses to generate sufficient energy to offset most or all of their electric power consumption. Larger maximums, say 50 or 100 kW, will allow consumers such as large retail stores, moderate-sized businesses, and schools to benefit. California's maximum size of 1 MW allows even large manufacturing plants an opportunity for net metering. And Ohio and Iowa have no size limits—any size wind turbine may be used for net metering.

- **Define the net-metering period as annual, not monthly.** Preferably, monthly credits for excess energy will roll over to the following month. This is an important consideration for wind power because of the seasonal variability of the wind resource.
- **Identify a method for handling net excess generation.** At the end of the net-metering period, either monthly or annually, the unused credits for excess energy are treated in one of two ways. In about half of the net-metering states, this excess is purchased. The payment is usually at the utility's avoided cost, although two states do require that the retail rate be paid. The remaining states stipulate that the excess is simply granted (given) to the utility. Giving the credits to a utility's low-income assistance program (as is done in Oregon) is a creative alternative that may help to maintain a sense of fairness for the net metering customer.
- **Allow only standard monthly charges.** Net-metering customers should be charged the same fixed, monthly fees as other customers in the same customer class.

More Information

Information about net metering:
http://www.eren.doe.gov/greenpower/netmetering/index.shtml.
http://www.dsireusa.org/.

Analysis of net metering (and other incentives) as a policy option for states:
http://www.nationalwind.org/pubs/strategies/default.htm.

An overview paper on net metering:
http://www.crest.org/repp_pubs/articles/issuebr2/issuebr2.pdf.